Photo. Berggren.

FIG. 1.—CHURCH OF ST. SAVIOUR-IN-THE-FIELDS, CONSTANTINOPLE.

THE MINOR BYZANTINE CHURCHES OF CONSTANTINOPLE.

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FEW great cities have a more beautiful site than that which is occupied by Stamboul, the oldest part of Constantinople; for the Constantinople of the present era consists of three parts—Stamboul, Galata with Pera, and Scutari—and these three are divided from one another by water, the first two by the Golden Horn and the latter two by the swiftly flowing Bosphorus.

Stamboul is the ancient Byzantium, which in A.D. 330 was adopted by Constantine as the capital of his empire, and it is in this portion of modern Constantinople that all the Byzantine churches are situated.

Byzantine architecture received its name from Byzantium, for it was here that this style expressed itself in its purest form. The Byzantine style is the direct descendant of those of Greece and Rome. In classic Greek work we do not find the vault, but in the great buildings of the Roman period we find it largely used. This feature—the vault, and its development the dome—was carried to perfection in the Byzantine period, for the dome and its supports form the principal constructive feature of the style. Then the materials available for building

purposes in Constantinople were marble, brick, and lime, and it was in simple wall building and vault construction that the architects could use these most effectively. Further, it is remarkable how the use of the dome in conjunction with the requirements of early Christian ritual led to the square form of plan known as the Greek-cross type, to which nearly all the Later Byzantine churches belong. Directly in the centre of the square the dome is supported either by piers or columns, it being a characteristic of the style that columns were used for constructive purposes chiefly, and here, as supports for the dome, we find the Byzantine use of columns exemplified.

Having remarked on how Roman work influenced the Byzantine, reference may now be made to Greek influence. If we recollect that the builders of the Byzantine period were Greeks—descendants of those who built the classic Greek buildings—we can understand that the spirit of their handicrafts lived on and could not but display itself in all buildings on which they were engaged. This influence is most distinctly seen in Byzantine carved work which is so largely composed of the Greek acanthus, being sharp and prickly, not rounded and soft like the Roman or Romanesque one, but is also apparent in that air of refinement existing in the Byzantine buildings which is not found in Roman work, and which undoubtedly came from Greek sources originally.

That quality of architectural style known as breadth is expressed with rare perfection in Byzantine work, for in it the proportion of solid to void is admirable, while the exceedingly minute and rich carving often found only enhances this quality and makes it more evident. Therefore the Byzantine style is well worthy of being studied by architectural students in order that they may be enabled to grasp this most important quality in architectural design—one which is so much required and so difficult to obtain under present-day conditions.

Throughout the East the exteriors of buildings are kept as plain as they can be, while the interiors are as richly decorated as possible. For instance, an ordinary domestic building in the East is simply a whitewashed mass externally, with an opening for a door; but internally there is a courtyard, generally with a fountain or well in it, surrounded with flowers, and there are doors and windows which all give the interior a treatment and effect little expected by those who view the exterior only. So, similarly with the ecclesiastical buildings of the Byzantine style, their exteriors are remarkably bare of enrichment, and their chief value is derived from their expressing clearly the main parts of the design; also because they show a simple and straightforward attempt to build with the materials at hand. But in the interiors we find that marble is used to cover the brickwork from the floor level to the start of the vaults, this material having received distinctive treatment in design whereby it produces a most beautiful effect while truthfully expressing the fact that it is but a covering.

The vaults are treated in mosaic—broad, quiet, and rich, because of its gold ground—while the floor is generally either of marble slabs or of mosaic. What treatment of the interiors of churches could be finer? Undoubtedly these were of surpassing beauty, and show us the surroundings in which the Christians of the Byzantine period worshipped.

It is the Moslem custom to whitewash the exterior of their ecclesiastical buildings when they appear dirty, and the visitor to Stamboul at the present day finds that all such buildings are either yellow-washed or whitewashed. Those that are whitewashed are mosques erected since the Turkish occupation of the city, while the yellow-washed ones are the ancient Byzantine churches now in use as mosques, to which the attention of the reader is directed in this article, and it is of some of the less known or minor examples that descriptions are here given. Omitting, therefore, the well-known examples of Sta. Sophia—the glory of the Byzantine style—and SS. Sergius and Bacchus, commonly called Little Sta. Sophia, also that of the Holy Apostles which was destroyed in the fifteenth century, the order followed will be

as nearly chronological as possible, having regard to the additions and alterations to which these buildings have been subjected at various times.

The oldest ecclesiastical building now remaining in Constantinople is the Church of St. John the Baptist, which lies in the western part of the city, near the Sea of Marmora, and not far from the citadel of Yedi Kuleh. It was built in A.D. 463, the site having formerly been occupied by a church. The founder was a Roman named Studius; hence the church is often called St. John Studius, or simply the Studion. It was repaired in 1293, seriously injured by a fire in 1782, and is now in ruins. The visitor can see the interior only by looking through the low side windows; for it is not considered safe to enter the building. It was transformed into a mosque, and called Mir Akhor Djamisi, between 1481 and 1512; the narthex, which is the best preserved part of the edifice, being now used for that purpose.

The plan of the church (fig. 2), which is still wonderfully complete, shows it to be of the basilican type, with central nave and an aisle on each side of it, having galleries above the aisles which are now without floors; for these were of wood and have decayed. It is the only basilican church with wooden roof over the nave now remaining in Constantinople; all the other churches have either vaulted or domed naves, and are mainly of the Greek-cross type of plan with central domes. The body of the church is more nearly a square than those of the basilican churches in Rome, which are much longer in proportion. There are seven verde antique columns in the length of the church supporting horizontal architraves which form the colonnade on each side of the nave; only the shafts are preserved, however, for the bases and capitals have been destroyed. The detail of the entablature is also entirely gone, and above it there was an upper range of columns which supported arches and formed an arcade.

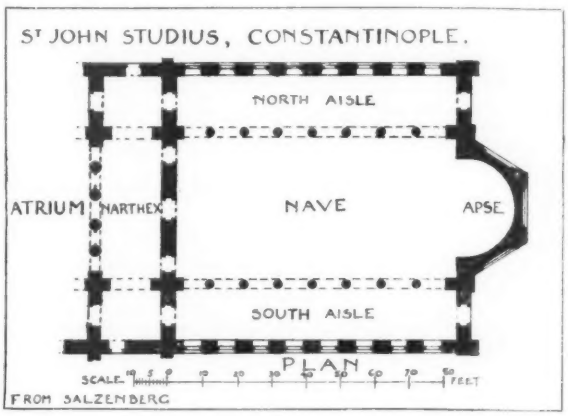


FIG. 2.

The apse is semicircular internally and three-sided externally. There are no windows in the apse, but on each side of the exterior there is a recessed panel having a round arched head.

The narthex has a colonnade of four columns in front which is now built up, but there is a door with a window above it in the central bay, and a window on each side in the bay next to the central one. The columns are of Christian date, although of the Composite order; for, besides the broad fillets at top and bottom of the shafts, the astragal of one of the capitals has a cross carved on its centre, and the several parts of the entablature are enriched with carving; while the cornice, being without a corona, has an effect similar to the interior cornices of Sta. Sophia. The whole entablature is of white marble. The atrium now exists only in outline and has a Turkish fountain in the centre.

The church belonged to a monastery, and the monastic cistern, though now dry, still exists to the south of the church, being only partly underground, while its vaulted ceiling rises above the level of the floor of the church. It has twenty-four columns, six in the length of the cistern and four in its width, having Corinthian capitals which support the vaulting of saucer-shaped domes. At the north-east corner of the cistern there is a small building, which in

plan resembles a Late Byzantine chapel, having an apse through which it is now entered and a groined vault over the crossing. The two columns at the crossing have Ionic capitals. The floor of this chapel is much higher than that of the cistern, although it is also partly underground. A part of the chapel projects into the cistern, and may have been a holy well. Above the vaulted roof of both cistern and chapel there is earth with a rich growth of grass and bushes.

The Church of St. Irene was originally built by Constantine the Great, but was burnt down and entirely rebuilt in 532 A.D. Although it was overthrown by an earthquake and restored in 740 A.D., yet its plan remains practically unchanged. Further, it has never been transformed into a mosque; but since the occupation of Constantinople by the Turks has been used by them as an armoury. Hence if the objects within it were removed it could at once be used for its original purpose. Its plan (fig. 3) is basilican in type, because it has nave and aisles; but the nave arcading is not continuous, the total length being divided into two unequal parts by a broad pier with barrel vault across the nave. This pier gives the plan of the church some resemblance to that of the Church of St. Demetrius at Salonica. Above the arcading there were three ranges of semicircular-headed windows in the screen walls under the large arches which support the domes. With so many windows in the outer walls the domes may well be solid and without windows for lighting the interior. This is the case with that part of the nave nearer the narthex which is covered with a low solid dome, elliptical in plan and without openings for light; while the part adjoining to the east is square and has a dome of circular plan with a high drum containing twenty windows. Considering the large amount of window space in the outer walls, there is not much need for this dome with its ring of lights; and as this

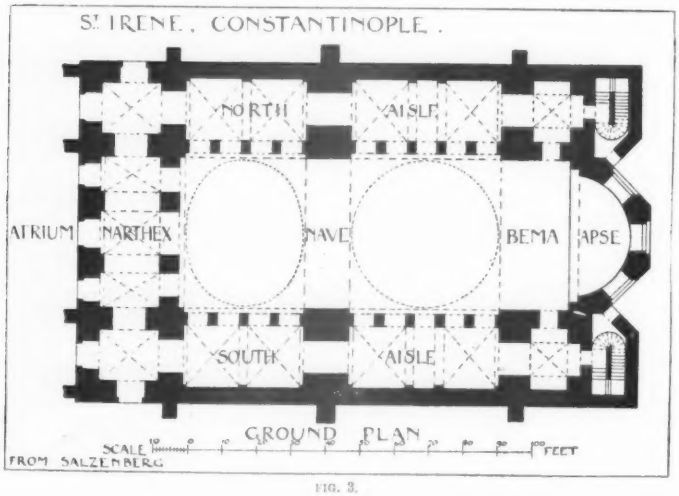


FIG. 3.

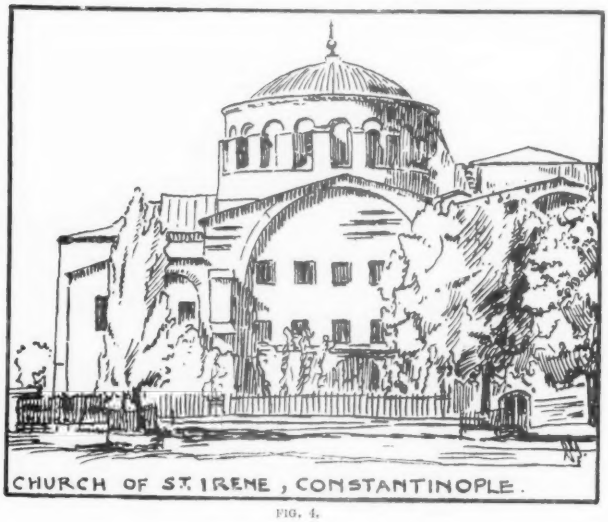


FIG. 4.

dome is thought to be a later addition, its probable date being about 740, there may have been originally a lower dome without window openings over this space also. This dome as it stands is of great interest, for, as Fergusson has pointed out, the light being introduced through the drum and not through the dome itself, as at Sta. Sophia, distinguishes in most cases the two periods into which Byzantine architecture is commonly divided, namely, the Old Byzantine, which culminated in Sta. Sophia, and the Neo-Byzantine, which with few exceptions had domes with high drums through which the light passed. Both domes are formed with pendentives. At the west end there is a narthex with gallery above it, also an atrium which appears to be of Turkish date. The apse is semicircular internally, but polygonal externally, and is lighted by three large semicircular-headed windows. In its interior there are five rows of seats for the presbyters, like those in Torcello Cathedral, under which is a passage close to the wall. There is a large cross of black tesseræ on the gold ground mosaic of the semi-dome of the apse.

The Church of St. Saviour-in-the-Fields, or Monè-tes-Choras (the Monastery in the Country), which was transformed in 1491 into a mosque and called Kahriyeh Djami, is near the Adrianople Gate, one of those in the land walls of the city (see fig. 1, headpiece). Although the original church on the site dated from before 413 A.D., yet of the present building only the central part belongs to as early a date as the time of Justinian—527–565. It was altered between 1081 and 1118 in the later Byzantine manner. Again, at the end of the thirteenth century it was repaired and had the two narthexes added.

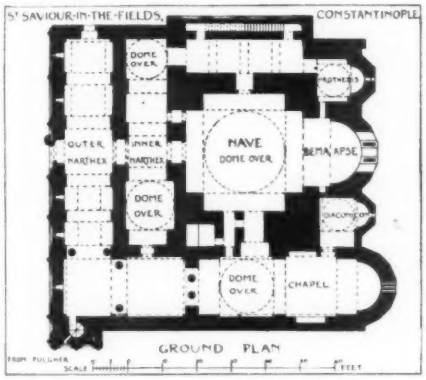


FIG. 5.

The nave is about twenty-four feet square, and takes the form of a Greek cross with very short arms, the eastern one being lengthened by a deep recess and terminated by an apse. The nave is covered with a dome set upon pendentives, and having a high drum in which are windows. Its walls are lined with grey and red marble slabs from the floor to the springing line of the arches forming the pendentives: underneath these arches are semicircular-headed windows. Above this line all is thickly coated with whitewash, which, it is thought, covers mosaic.

The apse is semicircular internally and polygonal externally, having on each side of it small chapels or vestries which have apses to the east of similar form, but with single lights; while the central apse has a fairly large three-light window.

Westwards there are inner and outer narthexes (sometimes called eso- and exo-narthex respectively), the former communicating with the nave by a large door centrally placed, and by a smaller one to the north, which has specially treated jambs, consisting of richly moulded and panelled marble work (see fig. 7). These jambs probably formed a marble door at one time, the panels of which have been sculptured, but the sculpture has been entirely destroyed. Both doors have moulded marble architraves which are mitred at the angles, and have lintels with cornices over. This inner narthex is four bays in length, and has a dome over each of the end bays. These domes are unequal in size and are not symmetrically placed with regard to the centre axial line of the church. They both have high drums ribbed on the inside and have windows as in the central dome. The intermediate bays, as also all those of the outer narthex, have flat saucer-shaped domes. From the northernmost bay of the inner narthex a doorway

leads to a ribbed barrel-vaulted chamber having at its further end a door whereby a staircase is entered which leads to an upper chamber, also barrel-vaulted, from the side of which a window opens into the nave.

The outer narthex (fig. 6) is six bays in length, the last bay to the south giving access to a long chapel of later date than the nave of the church, and extending the full length of the

Photo. Gulmez Frères.

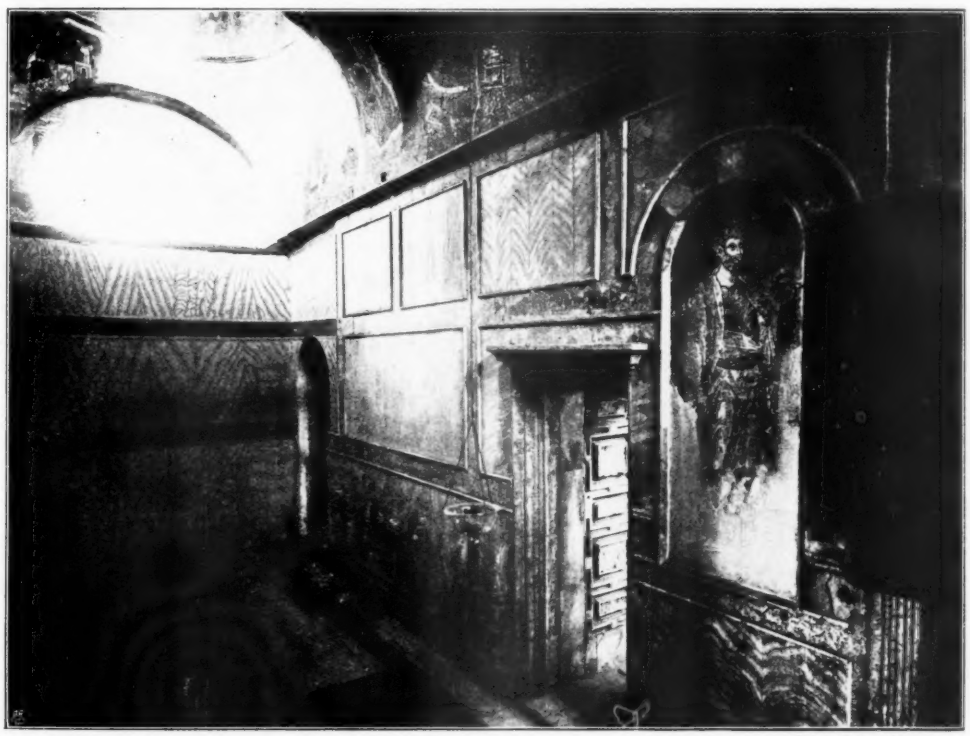
FIG. 6.—ST. SAVIOUR-IN-THE-FIELDS, CONSTANTINOPLE: OUTER NARTHEX, LOOKING SOUTH.

building, which has a dome, similar to the others, in line with the central dome and an apse to the east with three small lights. The archivolt and spandrils of a blocked-up doorway in the south wall and also those of the doorway in the north wall under this dome are very beautiful specimens of Byzantine carving. The southernmost bay of this narthex has received special treatment, the two sides to the north and the east having each two columns with beautiful Byzantine carved capitals supporting arches, the whole design being very effective in whatever way viewed. At its south-west corner a small door gives access to a circular newel stair which

now leads to a minaret; but it is probable that this angle was intended to be built as a high tower, and that this staircase was to be connected with it.

Great interest is taken in this church because in the two narthexes there is a series of mosaics of which the greater part is yet intact, although only some of the mosaics have been uncovered. These mosaics are remarkable for the smallness of the tesseræ used, which are much smaller than are generally met with in Italy, for the brightness and the harmony of the colours, as well as the excellence of the design, while the figures are beautifully drawn and executed. These narthexes are paved with white, black, and coloured marble slabs, and both of them have their wall surfaces covered with slabs of most beautiful marble from the floor upwards to the beginning of the mosaics at the springing of the arches.

The principal façade is to the west, and though evidently incomplete shows six large bays and a small one at its southern end. Each of these six bays has been built up, leaving only small window openings in them, except the bay on the central axis of the nave, in which is the doorway. The division of each bay is formed by a massive pier having a round attached shaft without a capital on its face. From a thin stringcourse at the top of this shaft there springs a plain arch in two orders. The edifice is entirely constructed of alternate layers of marble and brick, but the building of the southern chapel is coarser than that of the main body of the structure. The domes and roofs are covered with lead, while the roofs of the four arms of the cross show externally the inner curve of the barrel vaulting which covers them without any ridge. The external grouping of the whole building is most picturesque, and this is aided by the inequality in size and irregularity in spacing of the domes.



[*Photo. Gulmez Frères.*

FIG. 7.—ST. SAVIOUR-IN-THE-FIELDS, CONSTANTINOPLE: INNER NARTHEX, LOOKING NORTH.

The Church of St. Mary Diaconissa is situated a short distance to the eastward of the Shah Zadeh Mosque. It was founded in 599, but is now known as the Kalender Khaneh Mosque, and is often referred to because of its beautiful marble wall panelling in the interior, which extends from the floor to the springing line of the vaults and dome.

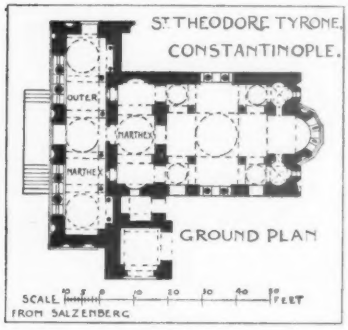


FIG. 8.

From an outer wooden porch a few steps lead downwards to the floor level. The outer narthex has, at the central part where the entrance is, a saucer-shaped dome, while each end is barrel-vaulted; the inner narthex has a barrel vault at the centre of its length and groined vaults at the ends. The nave takes the form of the Greek cross in plan by the position of the four piers which support the central dome, which has pendentives. The drum of this dome is not very high, but it is pierced with sixteen windows between which ribs travel from the springing to near the crown of the dome in the interior, while on the exterior the drum is circular in plan, and the dome is covered with lead in the usual way. Each arm of the cross is barrel-vaulted, and that to the east forms the bema which terminates squarely, as also do the chapels on each side of it; for in this church there is not the usual apsidal termination, either to the bema or the side chapels, which is so nearly universal in the plans of the churches of this period. There are two carved panels in the interior on the western wall of the church which are so classical in style that they are considered to belong to the date of the foundation of the church.

FIG. 9.—CHURCH OF ST. THEODORE TYRONE, CONSTANTINOPLE, FROM THE SOUTH-EAST.
From a Photo by the Author.

The Church of St. Theodore Tyrone, often wrongly called that of the Theotokos, is not far from the Suliemanieh Mosque. It undoubtedly occupies the site of an early church, but the present building is thought to date from the twelfth century, although some parts may be older; and others, such as the upper story of the façade, may be later. It is a small church, and is now a mosque called Kilisse Mesjidi.

The plan (fig. 8) of the church is of the Later Greek-cross type, having four slender columns which support the central dome, thereby dividing it into nave and transepts. From either side of the bema a door leads to a side chapel having an apse which is expressed externally by a semi-hexagonal form, which, however, does not project beyond the line of the

wall. The central apse is segmental internally and five-sided externally, having three rather large semicircular-headed windows separated by columns in the three central sides, while in the other two sides there is recessed blank arcading. Above these windows and recesses on the exterior there is another row of blank arcading, and the wall is finished with a projecting brick cornice above which is the roof tiling. The barrel vault of the bema is penetrated by a window on each side which on the exterior breaks the level line of the brick cornice. This cornice is carried round the arched head of the window, forming a rich hood mould.

The drum of the central dome is decagonal externally, and is seen to rise from a square base. Each angle of the drum is enriched by an attached circular shaft, and each face with a blank semicircular-headed window, forming an arcade all round; each face finishes with a deep brick cornice, segmental in elevation, which gives a lobed form to the roof of the dome.

There are inner and outer narthexes, the latter being of considerable interest because of the design of the lower story of its façade, which consists of a central doorway with a niche and then an arcade of three arches divided by columns, on each side of it, and finally between these arcades and the corners a semicircular-headed niche. The columns are of marble, and have richly carved capitals, those to the north being of the melon type, and those to the south Corinthian. Between the columns there is a panelled parapet with carved work of Byzantine type in the panels. Perhaps originally this outer narthex was only one story high, as in that of the Church of the Holy Apostles at Salonica, to which this lower story bears a close resemblance; for the design of the upper story as it exists at present does not harmonise with that of the lower one, hence there is every probability of its having been added at a later date. The façade of the upper story is divided into five bays by large arches which have windows in the screen walls under them. Over the central bay and the one at each end there is a dome having a high drum with a somewhat similar design to that of the central dome over the nave. The whole façade is most picturesque, but it is so thickly coated with yellow-wash that its detail cannot be properly seen. The edifice is built of bricks with intermediate layers of marble in the usual manner. The site is so closely surrounded by houses, with only a narrow street in front, that it is not possible to study the composition of the entire building on the spot.

FIG. 10.—CHURCH OF ST. THEODORE TYRONE, CONSTANTINOPLE, LOOKING EASTWARDS FROM THE GALLERY.
From a Photo by the Author.

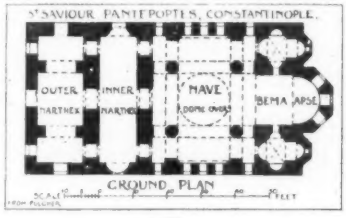


FIG. 11.

FIG. 12.—CHURCH OF ST. SAVIOUR PANTEPOPTES, CONSTANTINOPLE, FROM THE SOUTH-EAST.
From a Photo by the Author.

The monastic Church of St. Saviour Pantepoptes (the All-seeing) is near the mosque of Mohammed II., which is built on the site where the Church of the Holy Apostles stood. The church was built early in the twelfth century, and is a fine example of the work of that period. It was transformed into a mosque on the capture of the city by the Turks in 1453, and now bears the name of Eski Imaret Mesjidi. Although it is not a large building, it has a very complete plan, consisting of exo-narthex, eso-narthex, nave of the Greek-cross type, bema, apse, and side chapels, all well proportioned to one another and built in the Later Byzantine manner. The dome is supported at the crossing by four octagonal pillars, the apse is of the usual form with three large semicircular-headed windows, one on each of its sides, the side chapels being of beautiful plan and terminating eastwards in apses with single lights.

On the exterior of this church the quality of breadth is expressed in no slight degree. A Romanesque building of this date would be greatly broken up with pilaster strips, but there is nothing of the nature of a pilaster here—all is broad, simple, direct, while the central dome is of exceptional beauty. The drum is duo-decagonal on plan, with engaged columns at the angles, while in each of its sides there is a semicircular-headed window which has the usual brick cornice for hood mould, forming a fine example of the lobed form of roof so often found in Later Byzantine domes.

The Church of St. Theodosia is situated about halfway between that of Pantepoptes and the Golden Horn, slightly to the westwards. The date of its erection is unknown, but from

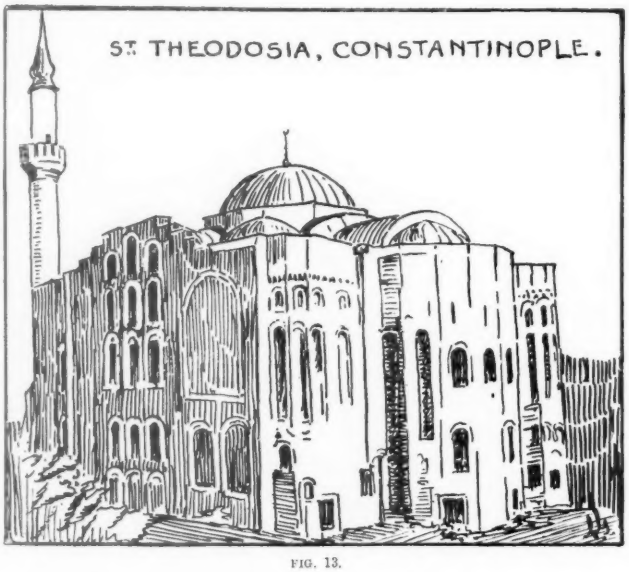


FIG. 13.

its style it is thought to belong to the tenth or eleventh century. During the sixteenth century it was consecrated to the Mohammedan faith and named Gül Djami, *i.e.* Mosque of the Roses. It is of the Greek-cross type in plan, and is in a remarkably well-preserved state at the present time. The interior is very well proportioned, and has galleries round three of its sides. The dome over the crossing has a low drum, and there are no openings for light either in the drum or dome, which are so commonly found in Byzantine churches of this period; but the lowness of the dome and want of provision of light from this source may be accounted for by the large and regularly placed windows in the outer walls of the building, for the interior is excellently lit at the present day. There are bema, apse, and side chapels, as are usually met with in churches of this type; but the narthex is of wood and is modern. Externally it is an extremely plain building, its chief feature being its great height, which makes it quite imposing.

The Church of St. Saviour Pantokrator (the Almighty Father) is situated on a hill near the inner bridge over the Golden Horn. There was formerly a monastery here, and what now remains is really three contiguous churches. The two outer churches are of the Greek-cross type in plan, each having a central dome carried, in the case of the southern church, on four clustered columns, while in that to the north it is supported by four small piers, and each church has its central and side apses, semicircular internally and polygonal externally. The central apses have each seven faces on the outside: a three-light window occupies three of these faces, while the others have deep semicircular niches. The side apses have each a single-light window to the east.

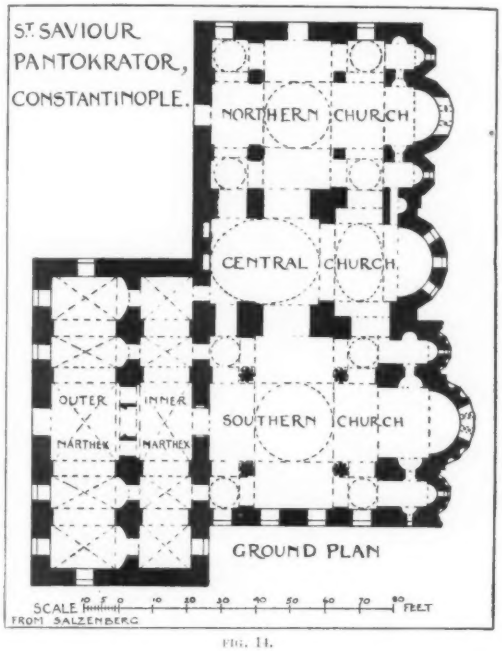


FIG. 11.

The southern church is the largest, and has inner and outer narthexes; hence it is probable that it served for parochial purposes, while that to the north was the conventual church. The church to the south is alone now in use, and it is a mosque called Zeirek Kilisse Djami. The church which separates the other two, occupying the space between them, is simply a hall covered by two elliptical domed ceilings and having an apse, toward the east, of somewhat similar form to the central apses of the other two churches; but its three windows are separated from one another by one of the exterior faces of the apse instead of only by columns. There are no side apses forming part of the central church. The division walls between the churches are pierced by wide semicircular-headed openings which would allow the utmost freedom in passing from the one church to the other. The central church may have been the mausoleum of the emperor Manuel Comnenus, who died in 1180. Regarding the date of this group of churches it is probable that they belong to the twelfth century.

If the thick coatings of whitewash were taken off the interior and exterior of these buildings much beautiful Byzantine carved detail would be seen. At the present time the existence of such detail is only found either by close observation of the whitewashed surface, or where the coating has fallen off the carving is seen to be as perfect as the day it was executed.

There is a fine piece of marble pavement with slabs of red porphyry inserted in it at the junction of the central and southern churches. The pulpit contains much fine Byzantine carving. The edifice generally appears to be built of brick and marble intermixed, but the jambs of the central door between the narthexes are of beautiful monolithic slabs of red marble richly moulded, and no doubt originally the interior was lined with marble from the floor to the springing of the vaults.

The conventual Church of St. Mary Pammakaristos is on the highest point of the valley of the Phanar; and though its five domes group picturesquely on the exterior, the interior is low and heavy. The central part of the church is of the Greek-cross plan, but instead of four slender columns at the crossing, which are so usually found in churches of this period—about the twelfth century—there are here four very heavy piers supporting the central dome, and the arches joining these piers are heavy too. There are inner and outer narthexes, also chapels to the south and north, which combine to make a rather complicated plan. The domes all have high polygonal drums which are pierced with semicircular-headed windows. The north-eastern dome has internally very beautiful mosaics, while in the south-east corner of the church there is one of the most beautiful little Byzantine chapels extant. The interior of this chapel is all white-washed, but externally its central and side apses are clearly marked, and the polygonal central apse is richly treated with three rows of blind arches divided in the central row by beautiful carved pilasters between which no doubt there were originally windows; but now these are filled up excepting a narrow slit in the central space. The cornice is deeply corbelled and has a bold yet rich effect. On the north side there is a long stringcourse, with an inscription in Greek carved upon it, which has a fine decorative effect; altogether this chapel is of particularly good design in the Later Byzantine style.

FIG. 15.—CHURCH OF ST. MARY PAMMAKARISTOS, CONSTANTINOPLE, FROM THE SOUTH-EAST.
From a Photo by the Author.

The church was the seat of the Greek Orthodox patriarchate from 1456 to 1591, when it was transformed into a mosque named Fetiyeh Djamisi, *i.e.* Mosque of the Conqueror, and probably to this time of change belongs the square eastern part of Turkish design and execution which occupies the site of the original central apse of the church. In itself this portion is not without interest as showing how the Turks altered the original building to make it suitable for their own purposes, while externally the peculiarly Turkish way in which the low octagon rises from the square base, and is roofed with a circular dome covered with lead, is very fine; but the whole is certainly out of place at the east end of a Byzantine church.

The Church of St. Mary Mouchliotissa (the Mongolian) is a small church which was founded in the thirteenth century, and though still a Greek church is known by the Turks as Kan Kilisse, *i.e.* the Church of Blood. Unfortunately the church has been so greatly altered and added to, that its original plan is difficult to trace; but the Byzantine part which remains shows that it was of great interest, and that it bore some resemblance to that of the Church of the Holy Apostles at Athens. It appears to have had a square central space roofed by a dome, and on each of its four sides there were apses each of which had three smaller apses springing from it.

FIG. 16.—CHURCH OF ST. MARY PAMMAKARISTOS, CONSTANTINOPLE: DETAIL OF EXTERIOR OF BYZANTINE CHAPEL.
From a Photo by the Author.

Reference to a distinctive feature of these Byzantine churches in Constantinople will fitly close this article. It is remarkable that nearly all the churches herein referred to have both inner and outer narthexes, the exceptions being St. John Studius and St. Irene, which have atria, and St. Mary Mouchliotissa, the plan of the narthex of which is uncertain owing to its having been entirely altered. This double narthex exists, along with the atrium, only in Sta. Sophia, Constantinople, and its existence in this instance may be accepted as a necessary part of this great church; but it may be considered worthy of remark that probably the outer narthex of these later churches took the place in the service of the church and in the plan occupied by the atrium in the early ones. Of course there are early churches with both inner and outer narthexes, such as the Eski Djouma Mosque at Salonica, but the double narthex is not a feature of Western Christian churches; and this leads to the reflective remark that the requirements of the ritual and the architectural treatment of these Byzantine churches are inseparably allied, and in combination form a harmonious and beautiful style.

NOTE.—The plans accompanying this article are all to the same scale as those of the churches of Salonica (dealt with on pages 33 to 48 of the present volume), to enable the reader to compare easily the relative size of the churches of Constantinople and Salonica.—C. G.

GREATER LOMBARDY.

"Quod si judicium illud vulgatum dialecticorum tam operosum fuerit, et tanta ingenia exercuerit; quanto magis laborandum est in hoc altero, quod non tantum ex mentis penetralibus, sed etiam ex naturæ visceribus extrahitur?"

I BELIEVE that Signor Rivoira will appreciate the reasons which have made me place at the head of this article a sentence from the *Novum Organum*. In his modesty he would deprecate any comparison of himself with Francis Bacon, but he must needs admit that his reiterated plea for a *true induction* has a ring that recalls very vividly the pass-word of England's great philosopher. Bacon, to be sure, was busy in the realm of natural science, while Signor Rivoira is concerned with the products of a human art;* but the process of gathering and using for logical purposes the facts or phenomena out of which alone classification can be systematised is much the same in either field. Both men have their quarrel with those who are content to adopt the axioms of others without an appeal to the evidences, or to form their own axioms on phenomena incorrectly classed.

There is surely something truly Baconian about the impetus with which he flings himself on the task of dissipating chaos. "The opinions of writers on the origins and development of the great architectural styles practised in Europe between the year 1000 and the advent of the pointed-arch are so diverse, and so dense is the tangle of 'influences' (Roman, Gallo-Roman, Byzantine, even Arabian and Barbarian) woven into these origins by authors who deign when facts are wanting to take their stand on fancies, that it is no easy matter to unravel them. And not only"—I am roughly paraphrasing Signor Rivoira's Italian—"not only have we to combat the constant and erroneous belief that the Christian styles of the early middle ages receive their guidance and inspiration from the East; we have further to reckon with (1) the lack of sufficient knowledge (historic, philologic, constructive, static, and artistic) in many of those who approach the problem of the middle ages without understanding it, and who, moreover, either cannot or will not handle the main issue without involving themselves in secondary interests; (2) the reluctance of some to open their eyes to the clear, tangible truth of facts, preferring even vague probability to naked verity; (3) a certain spirit of conservatism which abhors all that is new; and lastly (4) the general confusion which prevails as to the age and true characteristics of the buildings erected in the styles under discussion."

All this surely has the true touch of Verulam; and what brings us nearer than ever to the spirit of my text is this outbreak of aspiration: "Hard must be the road that I take and steep the mountain whose still virgin summit I aim to reach; yet by long preparation, by the gathering of knowledge that cannot come from schools or books, and by seventeen years of research and study, covering some thousands of buildings scattered throughout the ancient Roman world, I shall struggle to gain that summit and to plant there a standard in the name of archæological science." Is this not paralleled by the exclamation of Bacon?—"If that familiar process of the old logicians was so laborious and exercised such great wits, how much greater will be the toil in this other method of judgment which is extracted, so to speak, not out of the recesses of the mind, but from the very bowels of Nature."

You see the parallel. Rivoira's plea, like Bacon's, is that we must widen and systematise our evidences instead of sticking blindly to our assumptions or compiling our facts in undigested array. Our supposed conclusions on architectural developments and origins though based on data may be wrong, simply because we have not collected data enough, or not examined those data with sufficient care. Or, worse still, we may have adopted or invented theories of architectural progress which have no sane relation to facts at all.

"Therefore," says Signor Rivoira, though not in so many words, "follow me. I have, to be sure, an idea of my own about the development of mediæval architecture, and like other philosophers of art I should like to see it proved and established, but we will act, if you please, not merely by taking this idea as the nucleus and gathering the facts round it, bringing the convenient facts into strong light, and putting the awkward facts in the background, but we will collect all we can, placing no limit but human capacity on the size of our gathering ground, and having marshalled all we can collect we will let the facts decide how far the theory holds good. For practical convenience we will classify the material more or less geographically and more or less chronologically, but wherever a question of origins calls for allusion to another country or another date, we will transfer our glance to that other land or period, and call up the illustrations that will meet our case." Such briefly is the author's method.

In his earlier volume (which, by the way, was reviewed by me in this JOURNAL five years ago under the title "Ravenna's Claim"*) Signor Rivoira set forth with great wealth of illustration (and in the most beautiful of European languages) his view that the Italian styles of the first ten centuries after Christ were essentially Italian, and by no means derived from Byzantine or other external sources.

In that volume, to quote his own words, he "traced the origins of the Lombardic vaulted (or round-arched) basilica, that great trunk, so to speak, from which were taken the cuttings which in turn

* "Le origini della Architettura Lombarda e delle sue principali derivazioni nei paesi d'oltr' Alpe." Vol. II. By G. T. Rivoira. Rome. Price 55 fr. Ermanno Loescher & Co. 1907.

* JOURNAL, 25th January 1902.

propagated the primary and secondary styles that flourished in so great a part of Europe during the twelfth and thirteenth centuries. He will now follow the history of its principal descendants in the Transalpine countries, confining himself to the main or principal derivatives, and leaving out of present consideration the secondary developments.

His guiding thought he expresses as follows: "With the appearance of the Lombard basilica, there sprang up beyond the Alps a whole crop of new-born building methods like flowers in early summer, and chief among them the styles which I prefer to call the Lombardo-Norman and the Lombardo-Rhenish. The term 'Romanesque,' though commonly applied to an extended period of mediæval art, does not seem to be justified, for if employed at all it might reasonably be applied to the Byzantine style, among others, seeing that the round-arched Byzantine basilica in its most favourable expression—the church of Santa Sofia at Constantinople—undoubtedly took its birth in the Baths of Rome.

"Under the sponsorship of the Benedictines, who carried them across the Alps, nurtured them, and adapted them to the rites of their order, these two styles, modified to suit the tendencies, genius, and climate of the nations into whose country they were transported, clothed with new forms and treated with a variety of new ideas, travelled far and grew apace under the guidance of these same monks."

Signor Rivoira's former task was, as I have pointed out, to prove the Italian origin of Italian architecture previous to the year 1000, or, in other words, to discount the supposed influence of external forces. In his new volume he is on less certain ground. His issue is less definite owing to the wider scope of his field, and his battle has a less clear crisis.

The theory that the entire round-arched architecture of Europe is bred from the architecture of ancient Rome can only be proved or disproved in a relative measure. On the one hand, not even Signor Rivoira would contend that the later and more distinct phases of these styles owed nothing of their characteristics to their remoteness in time and place; even he would not deny that special localities and special periods introduced into the style features and forms which were not necessarily copied from Roman originals. On the other hand, the champions of national authority in design, even the keenest of them, would seldom go the length of asserting that there was any phase of Romanesque, Norman, Saxon, or Rhenish building which lacked visible derivation from that barbarous and beautiful style which in turn grew out of the ruins of classic Roman art.

In fact, art being what it is—a human activity so dependent on transmission as to be one of the strongest proofs of man's inevitable fellowship with his predecessors—it is sometimes as unnecessary to prove its continuity as to insist on its diversity.

It is one thing for Signor Rivoira to prove or at least to claim that the supposed westward flow of the work at Ravenna is in reality an eastward stream; it is another to insist too urgently that features which in later European art are apparently innovations are really evidences of "harking back" to Rome. It is, I know, ungenerous to press a criticism of this kind, especially as Rivoira draws his comparisons with the utmost moderation, bringing them forward rather as interesting correlations of style than as irrefragable proofs of origin; but I may explain my meaning by taking as an example the author's remarks on the circular openings with which we are familiar in the beautiful upper stage of the tower at Norwich. They remind Signor Rivoira of the similar rings on the Tomb of Eurisaces near the Porta Prenestina, with which indeed they are identical. But one plain circle is necessarily very like another, and it is at least doubtful whether similarity or even identity in so simple and obvious a form has any real significance. An interesting specimen of Signor Rivoira's fearless attack on received opinions is to be found at the close of chapter iv., which is the second of two chapters dealing mainly with the British Isles. He here makes a digression on the subject of the "Norman" buildings of Southern Italy and Sicily. "There are," he says, "writers on art who think that the basilica of the countries conquered by the Normans in Sicily and South Italy is based upon the Lombardo-Norman church; but in reality an examination of the most notable churches of this region (and period) leads to the discovery that in them are to be found only two characteristics inspired by the Lombardo-Norman cathedral, and these two characteristics are the plan itself and the use of intersecting arcades." He goes on to point out that they have on the other hand at least twelve strongly marked features which are not common to Norman architecture, but are for the most part exhibited in the earlier Lombard styles.

When a man has set himself to work on the line adopted by Signor Rivoira it is easy enough to direct against him the particular criticism that certain examples are missing, the absence of which makes his induction incomplete. It is obviously impossible for any single treatise or even a limited period of architecture to contain allusion to every building which falls within the period's range. It is therefore unfair to hurry to the index of this book and forthwith to complain that one has discovered an omission. But it has, oddly enough, happened to me to visit Loches during the weeks in which I have been studying this book, and on my return to England I turned with interest to the volume to find what Signor Rivoira had to say about this church, which so far from being a common-place example of Norman or transitional work is a building of almost solitary character. For some reason this strange church is left out of the author's record.

Writers of the last generation, men who saw Byzantine influence in the domes of St. Front at Périgueux, were puzzled by the hollow pyramids of Loches as being, so to speak, a vernacular solution of the problem which at St. Front was settled by the use of the Oriental dome.* It would be specially interesting to know what view Signor Rivoira takes of this building, of which Viollet-le-Duc wrote that it was "a strange and unique monument in which the influences of Oriental art are blended with the methods of construction adopted in the north at the beginning of the twelfth century."

Again, to take another example in the same neighbourhood, I am disappointed that we have not as yet Signor Rivoira's view of the domes of Fontevrault.

I have put forward these points not by any means as adverse criticisms, but merely because the interest which this volume arouses makes one naturally wish for an extension of the author's view to cover the whole of his legitimate ground.

In any case the world of architectural students owes him thanks for bringing his group of examples together, and for connecting them around his interesting theory.† A writer who is bold enough to set forth on a large view of this large subject, who has the courage to open our eyes to the unity and immense reach of that great art which even in days of turbid government and laborious travel could override the boundaries of nations and link the centuries by a continuity of tradition that defies time, is at once enlarging (and simplifying) our grasp of the subject, and is at the same time breaking down those artificial classifications which are apt to be engendered by national and chronological analyses. Supposing Signor Rivoira's theory were unsound—which for my part I am far from thinking it to be—there would still be great value and great truth in his view that the architecture of Europe in the first twelve centuries of our era must be studied as a central force, even if we also, and rightly, study it in geographical and historical departments. If any man doubts the power of an architectural impetus to pour over vast tracts of alien country with the force of a torrent, he can prove it to himself by an example much nearer in date than the Lombardic period. The Renaissance, that second Italian wave, rushed not merely through the wide channels of European courts and commerce, but sent its ripples lapping into the remotest creeks and caves. I remember walking some years ago into the market-place of a small town in Brittany to find facing me an apparently Gothic church. Its tower, its outline, and in a general way the shape of its windows conformed to Gothic type; but when approached this village church showed that on every moulding, on every stringcourse, arch, and jamb there lay, most tenderly and most delicately, the mark of Italy's revival. The thoughts and skill of Tuscany and Rome had travelled, welcome pilgrims, to this far-off spot, and had there broken through the traditions to which generation after generation of church masons had clung. If the whim of princes could so foster in France the methods of Italian culture as to transplant into a remote untutored district the conceits of Alberti and Bramante, how can we wonder if a society greater than any aristocracy and less limited than any court—the Catholic Church herself—was able to stamp an identity of character on the buildings which after all have no meaning except the meaning which implies and involves community?

PAUL WATERHOUSE.

* I notice that Signor Rivoira, contrary to expectation, speaks of St. Front as being "di stile bizantino-veneto, rannodantesi all' Oriente con l' intermediario di San Marco," though he insists, as do other authorities, on the comparatively late date of the church, making it 1120 instead of 1047. One would expect to find him taking a firm stand for the European origin of this domed building, which eleven years ago was proved by Mr. Phenè Spiers to be not Byzantine but indigenous.

† The general plan of the work is easily explained. The introduction is followed by a chapter on the "Lombardo-Norman" architecture of Burgundy, and this, again, by one on the development of the same style in Normandy. Britain is then represented by two chapters, the first being on religious architecture in our islands before the Conquest, and the second on the "Lombardo-Norman" work which the Conquest introduced. Lastly come two corresponding chapters on Germany, the earlier carrying religious art up to the year 1000, and the later dealing with the fully developed "Lombardo-Rhenish" style. There are over 650 illustrations, and as the author keeps up throughout the volume his interesting method of retrospection, the photographs found under any given geographical or chronological heading are often of subjects very far removed in time and place.

SCHOOL HYGIENE.

Buildings and their Equipment.

Mr. Thomas E. Collcutt, *President R.I.B.A.*, presided over the section "The School Building and its Equipment" at the International Congress on School Hygiene held at the London University from the 5th to the 10th inst. The following is an extract from his Address delivered at the opening of the sitting:—

In designing school buildings, the architect is generally obliged to limit his expenditure, so that there are seldom opportunities for much ornament or display. This in itself is not a disadvantage. There is no necessity for elaboration of design, but fine architecture is always desirable, and is quite possible without rich and expensive detail. In every school building, however simple in general construction, there should be at least one feature of architectural worth. Should this be a fine doorway or any other detail, let it be good enough to be a source of pride to the school. An important factor in education is the development of that appreciation of beauty in art or nature which is latent in most of us. If school teachers can learn to be proud of some part or feature of their building they will be able prob-

ably to inculcate some such feeling in their scholars. I believe that a sense of admiration for the handicraft of others leads to emulation of the right kind, and a fine example in stone or woodwork may prove of great educational value to our budding craftsmen.

Another point on which I should like to touch is the finishing of the walls in class-rooms, &c. With all deference to sanitary and hygienic opinion, I feel I must protest very strongly against the use of glazed surfaces in schools and class-rooms. Perfect as glazed tiles are in every way when used in legitimate positions for lining lavatories, cloak-rooms, &c., they are inappropriate and unsightly as wall decoration for living rooms. My own experience in a certain room lined with faïence has been that of discomfort and irritation. Being, as you will allow, something of an expert where domestic architecture is concerned, I was able to trace the cause of my discomfort to the glaze of faïence. Surely children, without knowing whence the depressing influence arose, might be quite as much affected by it. Too much stress cannot be laid upon the importance of having warm and pleasant colouring upon the walls; the cold and drab colours which are so much used should be avoided. In London and large towns there is too much that is dismal and smoke-defiled outside, and the interiors should be cheerful. Children's eyes wander even when their attention is supposed to be engaged, and they should surely have something pleasant to look upon. Their school-rooms, in fact, ought to be such rooms as we would not mind occupying ourselves. To illustrate my point let me draw attention to the Doss-house in Parker Street, which I saw after it had been occupied for two years. This building is a common lodging-house for the poorest classes, the charge being *5d.* a night for a bed. The common-room is decorated in a way that might by many be considered inappropriate to the class of persons by whom it is used, but I consider that the money spent on beautifying it has not by any means been thrown away. The whole of one end of the room is occupied by a carefully designed fireplace surmounted by a mural picture. The woodwork of the walls and of the fixed seats is of equal merit with the other work, and is painted in rich and pleasant green. This sort of decoration, without being expensive, is highly effective. When you consider the exceedingly low charge for a bed, and for the use of this room, you will realise that the Doss-house is occupied by the poorest of the poor. The casual occupant may be anyone, from the young hooligan to the most hardened vagrant, and yet after two years' continual use I saw absolutely no sign of rough treatment. The painted woodwork and the walls were all in as good condition as if the room had been dwelt in by educated people. Any signs of wear visible were certainly not caused by malice, or even carelessness. It seems to me that the fact of this respect shown to a good building proves that even the minds of the very poorest may be accessible to feelings of beauty. If adults of the degraded though not criminal classes are sensitive to the influence of beauty, how much more must this be the case with the plastic mind of childhood.

There is nothing more necessary to the well-being of children than good ventilation. Of all the systems at present in use, some of which are certainly excellent, not one can be said to approach perfection. In forthcoming papers you may hear many methods strongly advocated, but I venture to assert that, whatever may be the virtues of such systems, all will leave something to be desired. Architects agree that open fireplaces and open windows are essential supplements to any other kind of ventilation. All who have to do with children know that they thrive best in the open air. Doctors insist on open air for anæmia and chest diseases and for minimising the risk of any sort of infection, and no system of ventilation has yet been discovered to supersede the open-air treatment for consumptives. If prevention is better than cure it behoves us to see that the children of the nation are taught as much as possible in fresh air. As a matter of example, it is desirable that children see that frequent changing of the atmosphere is insisted on in the class-room. No patent system of ventilation will teach them the valuable lesson that they may learn by seeing the importance of having the windows open. As well teach them to cook by electricity, and then let them go back to their own cheap stoves, as expect them to learn the rudimentary hygienic truth that fresh air is essential in a class-room where the windows are all kept shut.

Lighting and Ventilation of Class-rooms.

Sir Aston Webb, R.A., opened the set discussion on this subject at the International Congress on School Hygiene, and delivered the following address:—

I am afraid there is nothing new that can be written on this subject, and I make no claim to any originality in these remarks, merely recording my own experience and what I believe to be the present practice in England. The reason, I presume, that led to this subject being selected for discussion at this Congress is the importance of the class-room as that section of the school building in which the scholastic portion of the teaching is carried on. Here the scholars spend practically all their school hours, and here their mental powers are put to the greatest strain, so that it is desirable that everything possible should be done to place them under the best physical conditions. The size of class-rooms is obviously closely related to the subject of lighting and is necessarily regulated by the size of the classes. These vary from the fifty or sixty scholars or more allowed in a public elementary school to the fifteen to thirty in a secondary school. The size is also regulated by the seating arrangements adopted, single seats taking more space than dual, the width of gangways and master's platform being also factors in the case. The purpose to which a class-room is put will also necessarily affect its size, but I am assuming that the class-rooms at present under discussion are the ordinary ones in which general subjects are taken.

The Board of Education lay down an average of not less than 10 square feet of floor space for each scholar in public elementary schools, and in this country this is generally adhered to; while in secondary schools, where single desks are used, a floor area of from 17 to 18 square feet is required, though, under certain circumstances, a minimum allowance of 16 square feet will now be accepted by the Board of Education. Given therefore the number of scholars to be provided, the above requirements fix the floor area of the class-room; but there still remains the comparative length, breadth, and height to be determined, matters on which the effective lighting and ventilation must largely depend. The breadth and length are, to some extent, governed by the type of seat employed, but the nearer a room approaches a square the better, with the limitation that a room can hardly be satisfactorily lighted if more than 24 feet wide, while 22 feet is better.

We will assume that the room is lit, as it should be, from one side only, which at once limits the depth from 20 to 24 feet; the length will then depend upon the number to be seated. The height of the room is also an important factor in the lighting, as the deeper the room the higher it should be, if the seats furthest from the window are to be properly lighted. For the purposes of acoustics and ventilation 12 feet is generally a sufficient height, though, if a large number are to be accommodated, 13 to 14 feet in height may be necessary. These regulations work out for a class-room in a secondary school for twenty-five scholars at 23 feet 6 inches by 19 feet by 12 feet high. Having settled the size of the class-room, the question of lighting has to be considered more in detail. It seems hardly necessary to mention that it should be lighted from the left hand of the scholar only. The size of glass area to be provided is more difficult to lay down. This will be affected by two considerations—the aspect and the situation. To take the latter first, it is obvious that a town school in a crowded part would not obtain so much light from a window of a given area with buildings opposite as a building situated in the open country with an unobstructed prospect. The same applies in some degree to the aspect, windows quite satisfactory for a northern aspect being unsuitable for a southern one. Class-rooms should be so placed that they have sun in them during part of the day, but not always; north, west, and south-west, if unprotected, should be avoided. The Board of Education lay down one-fifth as the approximate area of window glass to the floor area to light a class-room satisfactorily. In very confined sites, however, one quarter is sometimes found necessary, and in open and exposed sites one-sixth will sometimes suffice. Anything beyond the amount of glass actually necessary to give a satisfactory light is undesirable, as it tends to make the room cold in winter and hot in summer, and adds considerably to the difficulty of the effective treatment of the room, both externally and internally. The glass line should not be more than 4 feet above the floor, with the heads of the windows carried up as near the ceiling as possible.

The windows should be so arranged in the wall that all the seats are equally well lighted. This is apt to leave the master's desk somewhat under-lighted, and in order to rectify this Mr. Bell and I provided in the class-rooms at Christ's Hospital a small window to light the master's desk, kept low down so that he can also see out of it, and I believe this has been appreciated. Under no circumstances should there be windows facing the scholars, and windows in the opposite wall facing the master are almost equally objectionable. Mullions, transoms, and window bars are, in my opinion, unobjectionable if the glass area is calculated independently of them. Plain sheet or plate-glass is the best for glazing, and the view of the sky should not be shut out from the scholars. Glazed brick or tiled walls, except as dados, are not suitable for class-rooms of the character we are considering; the reflected light is trying to the eyes, and being non-porous they are not considered hygienic for crowded rooms. A white plaster ceiling is the best, with light green or grey walls according to aspect, the woodwork painted white or, better, left its natural colour. A glare in a class-room is to be as carefully avoided as gloom. The artificial light of class-rooms, perhaps, hardly comes under consideration to-day, but is of equal importance when much evening work is done. Carefully regulated incandescent electric lighting is the best, and greatly simplifies ventilation. Gas is better avoided. Perhaps the best illuminant is composed of inverted arc lights with the room lit by reflection from the ceiling, but it is extravagant in current. Single incandescent lamps equally distributed over the ceiling give a pleasant and well-diffused light. Groups of lamps in electroliers should be avoided in class-rooms. One eight-candle lamp, if not hung too high, should light sufficiently 24 feet super. of floor area.

For the ventilation of class-rooms it is more difficult to lay down any definite rules. The problem may be simply stated as follows:—

The time required to contaminate the air in a class-room of an elementary school of the capacity required per scholar—*i.e.* 10 feet per scholar—is eight minutes, while for that of a secondary school it would be a quarter of an hour. The temperature of the room, according to the rules of the Board of Education, has to be kept at from 56 degrees to 60 degrees Fahr. The problem, therefore, is how to change the air of a class-room from four to eight times an hour, and, at the same time, to avoid draughts and keep the temperature at from 56 to 60 degrees. In discussing ventilation it is not possible to exclude altogether the question of heating. This can be done by open fireplaces, hot water, or steam and warm air. In one set of competition conditions sent to me I was surprised to find a condition, drawn up by an eminent architect, stating that the top of the fireplace openings should be 4 feet 6 inches high above the floor. I subsequently learned that this was provided on the strength of an instance where it appears such openings were provided, and it was noticed the boys did not progress so well after they had grown above this height, the idea being that the air in the room was better at the lower level through the ventilation of the fireplace. Whether this was a fact I cannot say, but the regulation was not insisted upon when the building came to be erected.

Still there is, I think, undoubtedly in England a strong preference for the open fireplace and the open window, and no doubt there is much to be said for them, especially in small schools; in larger ones it is impracticable. At the same time, I am strongly of opinion that an elaborate system of heating and ventilation such as may be very necessary in such buildings as law courts or hospitals is not necessary in a school for healthy boys and girls. The open fireplace not only provides heat, but also a means of ventilation, and should be placed in the angle on the inner wall near the door, not on the window side, which is an outside wall, and which in such a position must place the unhappy master in a draught between the door and the fireplace. An extract can be obtained by another flue in the chimney-stack, and fresh air may be admitted at the back of the grate and from the corridor. By this means, however, it is impossible to insure with any certainty a regular change of air in the class-room or an even temperature. All extracts which are worked by what are called natural causes are, in my opinion, unreliable, and under certain variable conditions of temperature or wind pressure work uncertainly and sometimes even in directly opposite directions to that intended. To obtain results unaffected by these variations, mechanical means must be employed in the shape of rotary fans or other contrivances to move the air by either extraction or propulsion. If extraction is adopted, probably the best plan is hot-water radiators under the windows fitted with bafflers, behind which the fresh air admitted from

outside is warmed by passing over the radiators and the foul air is mechanically extracted at the ceiling level in the wall opposite. By this means, and with regulators on the inlets and outlets, the system can be sufficiently regulated, but it is as well also to supply an open fireplace, though the mechanical extract may interfere with its draught at times. The size of both the inlet and outlet depends upon the power of the fan employed. The alternative is the propulsion of warm air into the room by a fan, the air being admitted into the room about two feet below the ceiling, the outlet being at the floor level into the corridor immediately below the inlet over. The advantages of this system are the more equal distribution of the heat throughout the room, the absence of all heating apparatus, such as radiators, in the room, the avoidance of draught, the air in the room being under slight pressure, and the ease with which the apparatus can be used for ventilation purposes in summer time. The system requires to be planned with the building, and cannot, therefore, well be applied to old buildings. Each system, however, has its advantages, according to the size and special circumstances of the building; and with mechanical means now so readily at our disposal, there should be no difficulty in providing either the temperature or change of air that our medical advisers may decide from time to time to be necessary or advisable, for, after all, we must look to the medical profession to lay down the hygienic requirements of the children to be accommodated in these rooms, which it is our humbler but equally necessary part to see carried out as effectually and economically as possible.

REVIEWS.

GARDEN MAKING.

The Art and Craft of Garden Making. By Thomas H. Mawson. Third edition, roy. 4o. price 35s. [London: Batsford.]

It is certainly a gratifying indication of the progress in England, during the past few years, of the art and craft of garden making, that a third edition of this, the most important text-book on the subject that has yet appeared, should so soon have been called for. Those of us who have had the pleasure of seeing in execution some of the garden schemes that Mr. Mawson illustrates in this new edition will peruse the book with additional pleasure. The store of information it contains is very great, and cannot fail to be of considerable service to any architect whose practice lies in domestic work, for he will find many valuable suggestions for the treatment of house and garden as one whole design, and practical details for the formation of flower-gardens, of terraces, courts, and lawns, the treatment of water, and the construction of garden buildings. As to the choice of site Mr. Mawson aptly quotes the words of J. D. Sedding, who tersely summed up much that in times past has been the cause of controversy between the rival schools of formalists and landscapists. "The gardener's first duty in laying out the grounds is to study the site, its aspect, character, soil, contour, sectional lines, trees, &c. Common sense, economy, Nature, Art, alike dictate this. There is an individual character in every plot of land as to every human face, and that man is unwise who, to suit preferences for any given style of garden, or with a view of copying a design from another place, will ignore the characteristics of the site at his disposal." To realise the folly of introducing the garden design of a foreign country, it is only necessary to visit some of the great schemes carried out in the middle of last century in England, so-called Italian gardens, which, whilst they may be replicas in matters of detail, fall far short of the spirit and sense of fitness that made the gardens of Italy justly famous.

With regard to terracing, Mr. Mawson has certainly struck the right note in advising that terraces should not be considered merely as one long promenade, but rather as a series of gardens, each division having its own particular interest, the whole arranged in connection with the entertaining apartments of the house and forming a series of changes. This it is that gives so much more interest to the hillside garden than to one designed wholly on the flat.

As for summer-houses Mr. Mawson does not tell us much: the few which he illustrates exhibit a homely solidity that was always the characteristic of the best English garden architects until the rustic woodwork artist appeared on the scene. One can hardly help regretting that a more extensive use of treillage should not be made in this country. It is a cheap and most effective garden ornament and very suitable for positions where protection from wind is desirable. Moreover, in these days of short leases of property, it is often important to gain effect in a brief space of time. In this case there is no adjunct offering more possibility than treillage, and we have only to examine any of the old German or Dutch and above all French garden books to realise to what an extensive use treillage was put in the design of town and country houses of the seventeenth and eighteenth centuries.

Though England led the fashion in garden design, to its detriment, during the latter part of the eighteenth century, and the cult of the *Jardin Anglais* penetrated to every country of Europe, destroying hundreds of charming schemes from Italy to Sweden, we may be proud that she has made amends during the last quarter of a century, and has been the forerunner in the revival of the best traditions of garden design. The example has been closely followed by America, and signs are not wanting that it will soon be followed upon the Continent. We owe much to Mr. Mawson for the present work, one which by helping to educate the public cannot fail to be of great assistance to the domestic architecture of this country.

H. Inigo Triggs.

9, Conduit Street, London, W., 31st August 1907.

CHRONICLE.

Bethnal Green Municipal Buildings Competition.

The action of the President in declining to nominate an Assessor in the above competition unless certain objectionable clauses in the conditions were amended has had a satisfactory result. The grounds of objection were set out in the correspondence published in the last number of the Journal, p. 626. Some further correspondence has since taken place, and the Borough Council having modified clauses 4, 7, and 10 in the direction suggested by the President, the competition is now on a satisfactory footing, and the President has nominated Mr. Henry T. Hare as Assessor. Immediate intimation that the conditions had been amended was conveyed to the profession in a note from the Institute published in the professional journals.

Acton Council Offices Competition.

The Board of Professional Defence have had under their consideration the case of Mr. W. G. Hunt, architect, who had been instructed by the Acton Borough Council to prepare designs for their proposed new buildings to cost about £35,000, and as a result of their investigations the following correspondence has taken place with the Clerk to the Acton Borough Council:—

Royal Institute of British Architects,
9 Conduit Street, W., 12th August 1907.

The Clerk, Acton Borough Council,—

Dear Sir,—It has been brought to the notice of the Board of Professional Defence of the Royal Institute of British Architects that Mr. W. G. Hunt, of Vicarage Gate, W., having been instructed by resolution of your Council to prepare plans for municipal buildings at a cost of £35,000, your Council have refused payment for such services duly rendered.

If the facts as above stated are correct, my Board will feel it their duty to take immediate steps to prevent members of the R.I.B.A. from taking part in the competition which your Council are now instituting for such buildings.

I shall be obliged therefore if you will kindly send me any observations you may have to make not later than Monday, the 19th inst.—I am, dear Sir, yours faithfully,

Edmund Wimperis,
Hon. Secretary, Board of Professional Defence.

The Urban District Council of Acton,
242 High Street, Acton, 15th August 1907.

The Hon. Secretary, Board of Professional Defence, R.I.B.A.,—

Sir,—In reply to your letter of the 12th inst. the Chairman of the Acton Council desires me to say that the Council have never treated Mr. Hunt with other than absolute fairness and with due regard to their obligations towards him and to the ratepayers. As Mr. Hunt has chosen to challenge their action by issuing a writ against the Council it is clear that a precise answer to your inquiry is precluded thereby. This, however, is common ground:—

Mr. Hunt prepared designs, &c., for a Town Hall and Municipal Buildings for the Council without obtaining a contract under seal. The Council paid him £1,500 for such work, and were surcharged by the Local Government Board, with a strong intimation on remitting such surcharge a few months later that there must be no repetition of the occurrence. Subsequently the contract was sealed, and a further £900 was paid him *ex post facto* for the abandoned scheme which the Local Government Board has refused to sanction.

It is contended by Mr. Hunt that the Council requested him to prepare further designs by a contract also not under seal, and for that he now sues them. But it is also the fact that, so far from being warned by the previous attitude of the Local Government Board, he neglected the advice of the Clerk to the Council to have the alleged new contract sealed, and the reasons he may have had for so abstaining may be the subject of further consideration.

The Local Government Board Auditor, who has just completed the audit, has not surcharged the £900 paid to Mr. Hunt after the previous contract was sealed, but informed the Chairman of the Finance Committee and the objecting ratepayer that he had grave doubts whether he ought not to have done so.

If the Council paid any sum to Mr. Hunt under any unsealed contract in the face of these facts and the serious warning of the Local Government Board it would necessarily be surcharged with small likelihood of its remission.

This is but the outline of the matter which will be further considered by the Council at their next meeting on Tuesday next, when a further communication will be made to you.

The Chairman wishes further to say that so much has been explained to you from motives of

courtesy, but the Council will not and cannot recognise the right of any outside body to interfere with what they believe to be their just and impartial actions.—I am, yours faithfully,

WM. HODSON,
Clerk to the Council.

9 *Conduit Street, W., 21st August* 1907.

The Clerk, Acton Borough Council,—

DEAR SIR,—In reply to your letter of the 15th instant, which was considered by my Board at their meeting yesterday, I beg to say that we do not propose to interfere with any action your Council may think well to take, but only to regulate the conduct of our members and to protect them from injustice.

Architects constantly have to prepare drawings prior to, or without, a sealed contract, and in doing so they have to rely upon the good faith of their employers.

We hope to receive a satisfactory letter from your Council as the result of their meeting last night.—I am, dear Sir, yours faithfully,

EDMUND WIMPERIS,
Hon. Secretary, Board of Professional Defence.

Urban District Council of Acton, 22 *Aug.* 1907.

The Hon. Secretary, Board of Professional Defence, R.I.B.A.,—

DEAR SIR,—I am in receipt of your letter of yesterday's date, and would state that your communication of the 12th instant, together with my reply of the 15th, were submitted to the Council at their meeting on Tuesday evening last, and in accordance with their directions I forward herewith extracts from the Minutes of the Proceedings of the Council and Committees in regard to the new scheme for Council Offices.*

The copies of the Minutes relating to the old scheme, which was abandoned, and under which Mr. W. G. Hunt was paid £2,400, are not forwarded unless you should express a desire to see them, when no doubt the Council would comply with such a request. As a writ has been issued by Mr. Hunt against the Council, the Chairman wishes me to say that in his opinion it would be improper to discuss the matter further; but the circumstances of the case are such that he has no doubt if the matter is further gone into the good faith of the Acton Council will be clearly manifested.

Messrs. Hemsley & Co., of 13A Old Burlington Street, W., are the Council's solicitors, and will at their discretion answer any questions which they may feel justified in doing.—I am, yours faithfully,

WM. HODSON,
Clerk to the Council.

* The extracts which accompanied this letter consist of between thirty and forty foolscap folios, mostly printed matter. The material passages are set out in the Board's reply of the 26th inst. [*q.v.*].

9 *Conduit Street, W., 26th August* 1907.

The Clerk, Acton Borough Council,—

DEAR SIR,—I beg to acknowledge receipt of your letter of the 22nd inst., inclosing extracts from the Minutes of the Proceedings of the Council and Committees in regard to the proposed Council Offices, and thank you for your courtesy.

The said Minutes have been carefully perused, and the following extracts set forth the essential points:—

On the 17th July 1906 Resolution of the Council No. 789: "That the architect be instructed to prepare working drawings and specifications of the proposed Municipal Buildings."

On the 20th November 1906 Resolution of Council No. 1469: "That paragraphs 3 and 4 of the Minutes of the Committee be approved subject to satisfactory terms being arranged with the architect in connection with the preparation of the designs, &c., for the proposed Municipal Offices."

Paragraphs 3 and 4 were that the working drawings be approved, and the architect be instructed to prepare the necessary specification.

On the 19th February 1907 Resolution of Council 2181: "That Mr. Hunt, the architect, be offered a remuneration or commission of 3½ per cent. for the preparation of plans, acceptance of tenders, and supervision of the erection of new Council Offices, and all other usual work of an architect of and incidental to the preparation of plans, drawings, and specification, acceptance of tenders and supervision of the work, subject to his entering into a contract to the satisfaction of the Council for the performance of the said work and the acceptance of the remuneration or commission of 3½ per cent." *

On the 19th March 1907 the Agreement with Mr. Hunt was submitted to the Council for sealing. Resolution No. 2456: "That the sealing of the Agreement with Mr. W. G. Hunt, architect, be adjourned to the next meeting of the Council."

On the 26th April 1907 Resolution No. 101: "That the sealing of the Agreement with Mr. W. G. Hunt architect, be further postponed to a Special Meeting of the Council, to be convened for the purpose of considering the question of the erection of new Council Offices, on Tuesday, the 30th April 1907, at 8 p.m."

On the 30th April 1907 Resolution No. 111: "That a letter be forwarded to Mr. W. G. Hunt, architect, informing him that the Council have abandoned all thought of approving the plans for the new Council Offices as submitted by him, and that the matter has been referred to the surveyor to

* It should be mentioned that Mr. Hunt had previously been instructed to and had prepared a design and working drawings for a larger scheme of the Council to cost £80,000. The scheme was abandoned and the Council paid Mr. Hunt's professional charges. This explains why the remuneration for the £35,000 scheme was agreed at 3½ per cent.

prepare sketch plans and an estimate of the cost of erecting Council Offices, to provide the accommodation required by the Council."

On the 30th May 1907 Resolution No. 371: "That Mr. W. G. Hunt be informed that the Council do not at present see their way to make any payment to him or to receive any account for the scheme referred to (in Mr. Hunt's letter, dated 8th May 1907), but if use is made of his plans he will hear further from the Council upon the matter."

It therefore appears that the facts stated in my previous letter to you of the 12th instant are confirmed by your Council's Minutes. The only course, therefore, for us to take is to give notice to the members of the Royal Institute of British Architects to abstain from taking part in the proposed competition.—I am, dear Sir, yours faithfully,

EDMUND WIMPERIS,
Hon. Secretary, Board of Professional Defence.

On the 21st August the following letter was addressed by the Board of Professional Defence to the editors of the building papers, and appeared in their respective issues last week:—

21*st August* 1907.

SIR,—The Board of Professional Defence of the Royal Institute of British Architects, having now under consideration the differences between this Council and their present architect, requests members of the R.I.B.A. who propose to compete for this building to stay their hands pending further notice, which will be advertised in this column next week.—I am, Sir, yours faithfully,

EDMUND WIMPERIS,
Hon. Secretary, Board of Professional Defence.

On the 28th August the Competitions Committee sent the following communication to the professional press for insertion in this week's papers:—

"ACTON COUNCIL OFFICES COMPETITION.

"The Competitions Committee of the Royal Institute of British Architects have, upon representations made to them by the Board of Professional Defence, decided that this competition is one in which members of this Institute must not take part."

Eighth International Congress of Architects, Vienna, 1908: International Architectural Exhibition.

The General Regulations are to hand from Vienna for the International Architectural Exhibition proposed to be held in Vienna in connection with the International Congress next year. The Exhibition will be open from the 18th May to the 14th June, and will be held in the galleries of the I.R. Gartenbaugesellschaft, 12 Parkring, Vienna I.

The exhibition will be of a purely artistic nature, and is to consist only of works of living artists produced within the last decade. The exhibits are to comprise plans, drawings, and models relating to architecture, as well as paintings, sculptures, and works of the allied arts in so far as they are connected with architecture. Particular attention is required to be directed in the plans to typical productions. Ground plans should be only to a small scale and added merely where explanation is absolutely necessary. Photographs are excluded. The exhibits will also comprise all kinds of decoration of buildings produced according to designs, as well as works of the allied arts, singly, and—as far as space permits—in groups as interiors.

The exhibition will be arranged according to individual countries, to each of which a section will be assigned by the organising committee. The patronage committee of each country will be required to draw up their own special regulations for the nomination of judges and for the arrangement of their own exhibition.

The organising committee reserve to themselves the right of borrowing eminent works of art from the authors for decorating a reception room, and they will also be responsible for the decoration of the walls and ceilings of all the rooms. No rent for space will be required from exhibitors. Each patronage committee will have to bear the expense and risk of transport of their exhibits, as well as their arrangement, moving, and packing. The organising committee will insure the exhibits against fire during the exhibition.

Exhibits must arrive not later than the 4th May 1908, addressed "Baukunstausstellung, Wien I., Gartenbaugesellschaft." The names of the designers will be catalogued as exhibitors; and if specially desired the firms who have carried out the work may be added.

The chief executive officers of the Congress are MM. Otto Wagner, *President*; Karl Mayreder, *Chairman of Exhibition Committee*; Franz Freiherr von Krauss, *Secretary*.

Town and Dwellings Improvement.

The International Housing Conference, which met at the beginning of the month in Caxton Hall, Westminster, held a series of very successful sittings. Over four hundred delegates were present, foreign Governments being strongly represented. Mr. John Burns, President of the Local Government Board, welcomed the delegates on behalf of the Prime Minister and the Government and briefly addressed them. In England and Wales, he said, there were now half a million empty houses, London having fifty thousand. That was due to the improved taste of the people which housing reformers had developed. Modern suburbia would no longer live in basement houses. Thirteen thousand families left the inner ring for the outer ring of London per annum. The greatest boon to London had been the County Council, with its parks, its housing, and its cheap, popular, rapid tramway system. Mr. Burns said he would like a city with the gaiety of Paris, the alignment of Germany, the comfort of England, the picturesqueness of Venice, and the cleanliness of Amsterdam.

Mr. Alderman William Thompson, in the course of his Presidential Address, said they had met to fight a common enemy. They waged a crusade against dirt, degradation, disease, and death; against darkness, foul air, and foul water, with conditions of life which often made morality a miracle and common decency impossible, although these by no means exhausted the consequences of the body-blighting, soul-destroying effects of overcrowding and the slums. He believed they were all in entire agreement as to the need of a strong central body in every State to co-ordinate public and private enterprise more effectively than at present, to advise local authorities as to the best method of dealing with housing improvements, as well as to stimulate them in cases of neglect, and in the last resource to subsidise them if they failed to carry out the necessary work. They were all agreed that the new housing accommodation was insufficient in quantity, inferior in quality, or in many vital respects unsuitable in character; the place that should be occupied by cottages, for which there was a great demand, being filled by a kind of spurious villa which was not really wanted. It was therefore necessary to encourage some persons or authorities to increase, vary, and improve the supply of new and suitable dwellings. Let them hope in the near future to remodel their towns and substitute horizontal expansion with cottages and gardens served by electric tramways, for vertical extension with badly ventilated or comparatively sunless block dwellings. In the meantime a substantial reduction of cost could be secured by simplification of building by-laws and production on a large scale, based upon a system of standardisation of the parts of the house, and adoption of new materials and economical designs. It was only recently that a concentration of effort had been devoted amongst architects to produce a really cheap cottage which shall be a desirable place of residence, and it was here that the Cottage Exhibitions did such useful work.

Dr. J. Stübben, of Berlin [*Hon. Corr.M.*], discussed town planning and building by-laws. He said that in very many Continental and English towns there were certain old districts to which air, light, and traffic had very imperfect access, and in which the houses were filled with bad, unwholesome dwellings. But in many new districts in towns also there were complaints of bad housing conditions. In England the chief causes of trouble were the bad state of buildings and yards and the lack of open spaces; in Germany the evil was chiefly due to the crowding together of the urban population in barrack dwellings. Owing to the inadequate separation of one dwelling from another, to the insufficiency of the space they provided, to the defective supply of light and air in many of them, as well as to the neglected condition of the separate dwellings, of the courts, staircases, and passages, as also to their high rents, these barrack dwellings were often regarded as a danger to the health and to the social and economical well-being of the community. It was one of the chief purposes of town plans and building by-laws to prevent the growth of similar conditions on ground which was still uncovered by buildings. In Germany more than elsewhere the State and the towns had given attention to this important purpose. In Germany more than elsewhere the regulation of the housing system was regarded as the concern of the community. Whilst in other countries—*e.g.* France, Belgium, and England—the division of building land near the towns into plots and the choice of the style of building were chiefly left to private interest; in Germany private interest, although by no means disregarded, was distinctly subordinated to the public needs. Considered in relation to the housing question, the town plan—called also town building plan or town extension plan—was essentially a plan for breaking land up into building plots. These plots ought to correspond by their situation, shape, size, and condition with the many and various requirements of future dwellings. Small dwellings for the large number of members of the lower class who had small means, dwellings of medium size for the middle classes, larger and very large houses for the well-to-do and the rich—these and other different kinds of dwellings decided the way in which land was divided. It was an artistic problem of great importance so to construct the town building plan that streets and squares might be of pleasant appearance, and that a beautiful town might be created. After explaining the building by-laws in Germany and the legal powers possessed by towns, he added that both town planning and building by-laws had long been dealt with as matters of science and art in German technical literature. Most towns paid great attention to these subjects. This, it was believed in Germany, was the right course to take. But, on the other hand, the conviction prevailed that modern town building was still only at the beginning of its development, and that especially the provision of dwellings required the use of many other means which must be simultaneously applied.

Miss Sybella Gurney (hon. secretary of the Garden City Tenants, Limited) followed. She said that the present overcrowding of houses to the acre would matter even more if it were to be extended indefinitely; it was important that it should be carefully restricted in all new districts. The limit might be put according to situation at a hundred rooms an acre or less. The space thus saved could be used for gardens or for providing open spaces. The plans should provide on a large scale for open spaces for play and recreation, and for enjoyment of nature. Turning to site-planning, there was one very general and very objectionable development which could be largely affected by it—namely, the present division of town neighbourhoods into villa districts and working men's

quarters. This was one of the most evil developments of latter days, and was bad for every reason, inasmuch as it prevented any feeling of neighbourliness from arising between poor and rich, it relieved the rich from sharing those local burdens which they ought to bear, it was unnatural and ugly. We are apt to think ugliness of little importance, but in reality it is of very great importance, not only in itself, but as an indication of something wrong behind. Only a generation that was spiritually and morally deficient could produce a civilisation as ugly as ours is to-day.

Crosby Hall.

Some statements that have gone the round of the press lately with regard to Crosby Hall have given rise to the impression that the preservation of the building is now assured and that further apprehension for its safety is needless. These statements, it appears, are a little premature. All that can be said is that those who are working to save the Hall have formulated a definite scheme —the only one, in fact, that presents any prospect of success—and that they are hopeful of carrying it through. If it is true that a large sum will have to be raised by public subscription, it is to be hoped that a subscription list will be opened without delay, for there can be little doubt that an appeal to the public in such a cause would be at once and liberally responded to.

The very practical proposal has been made that the minor City companies which have no hall of their own should combine and make Crosby Hall a centre for their meetings, &c. These companies number forty-two in all, and the amounts expended by them in hiring rooms for their meetings must in the aggregate reach a considerable sum per annum. If the Hall could be devoted to their purposes it would be a fitting use for it, and it is to be hoped that the idea will commend itself to them.

The King has written expressing the hope "that means may be found to preserve this interesting relic of old London," and it is understood that His Majesty is being kept advised of the progress of the negotiations.

The Rubens Ceiling at Whitehall.

The beautiful Rubens ceiling in the Banqueting House, Whitehall, will shortly be on view in its restored condition. For many generations this precious work, which was executed by the great painter to the order of Charles I., has been but imperfectly seen through its coating of London grime. Some months ago the Office of Works undertook its cleaning and restoration, and it is understood that this has been very effectively done. The original colours have returned with unexpected brilliancy, and the complicated work of repairing the painting itself has been most successful.

Colonial Appointment for an Architect.

The Government of Jamaica invite applications for the post of surveyor and architectural officer, at a commencing salary of £600, before 10th September. Candidates must be thoroughly qualified as building surveyors and, if possible, designing architects, and must have worked under some important municipal body.

The Alexander Thomson Travelling Studentship.

This Studentship, value £60, which is competed for every third year, is open to architectural students between the ages of nineteen and twenty-eight years, residing in the United Kingdom. The Council of the Glasgow Institute of Architects are the Trustees. The Studentship was founded for the furtherance of the study of ancient classic architecture as practised prior to the commencement of the third century A.D., and with special reference to the principles illustrated in the works of the late Alexander Thomson. The subjects set for the next competition are a City Church, capable of accommodating in the area 1,000 sitters; and a Clergyman's House, with Session-house or Clergy-room. Competitors must also submit Three Studies of the Classic Orders; a Drawing from the round; and two sheets of Architectural Studies. The drawings must be delivered at the address of the Secretary of the Trust, Mr. C. J. Maclean, 115 St. Vincent Street, Glasgow, before 4 p.m., 28th December 1908. The successful competitor will be required within two years of the award to go on a sketching tour for three months to pursue his architectural studies. A prize of £20 is offered for the second best set of drawings should the number of competitors and the quality of the work warrant it. Programmes and all particulars may be had from the Secretary of the Trust as above.

Reinforced Concrete in Admiralty Buildings.

Replying to a question in the House of Commons last week, the Secretary to the Admiralty stated that "Reinforced concrete is used by the Admiralty in the construction of floors, jetties, &c. Though the prime cost is higher than that of timber, the small cost of maintenance renders it more economical, and there is no reason to anticipate that it will not continue to be satisfactory. It was first used by the Admiralty in 1904."

Memorial to Henry Allen Prothero [*F.*].

A committee is being formed for the purpose of raising funds and otherwise providing for the erection of a memorial to the late Mr. H. A. Prothero in the chapel of Cheltenham College. Mr. Prothero was educated at Cheltenham College, and the beautiful chapel of which the College is so proud was probably his most considerable work.